



A.D. 1842 N^o 9412.

S P E C I F I C A T I O N

OF

WILLIAM PRITCHARD, SENIOR,

STEAM-ENGINE AND OTHER FURNACES,
AND APPARATUS FOR REGULATING
SUPPLY OF AIR THERETO.

L O N D O N :

PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY :

PUBLISHED AT THE QUEEN'S PRINTING OFFICE, EAST HARDING STREET,
NEAR FLEET STREET.

Price 6d.

1854.



A.D. 1842 N° 9412.

**Steam-Engine and other Furnaces, and Apparatus for
Regulating Supply of Air thereto.**

PRICHARD'S SPECIFICATION.

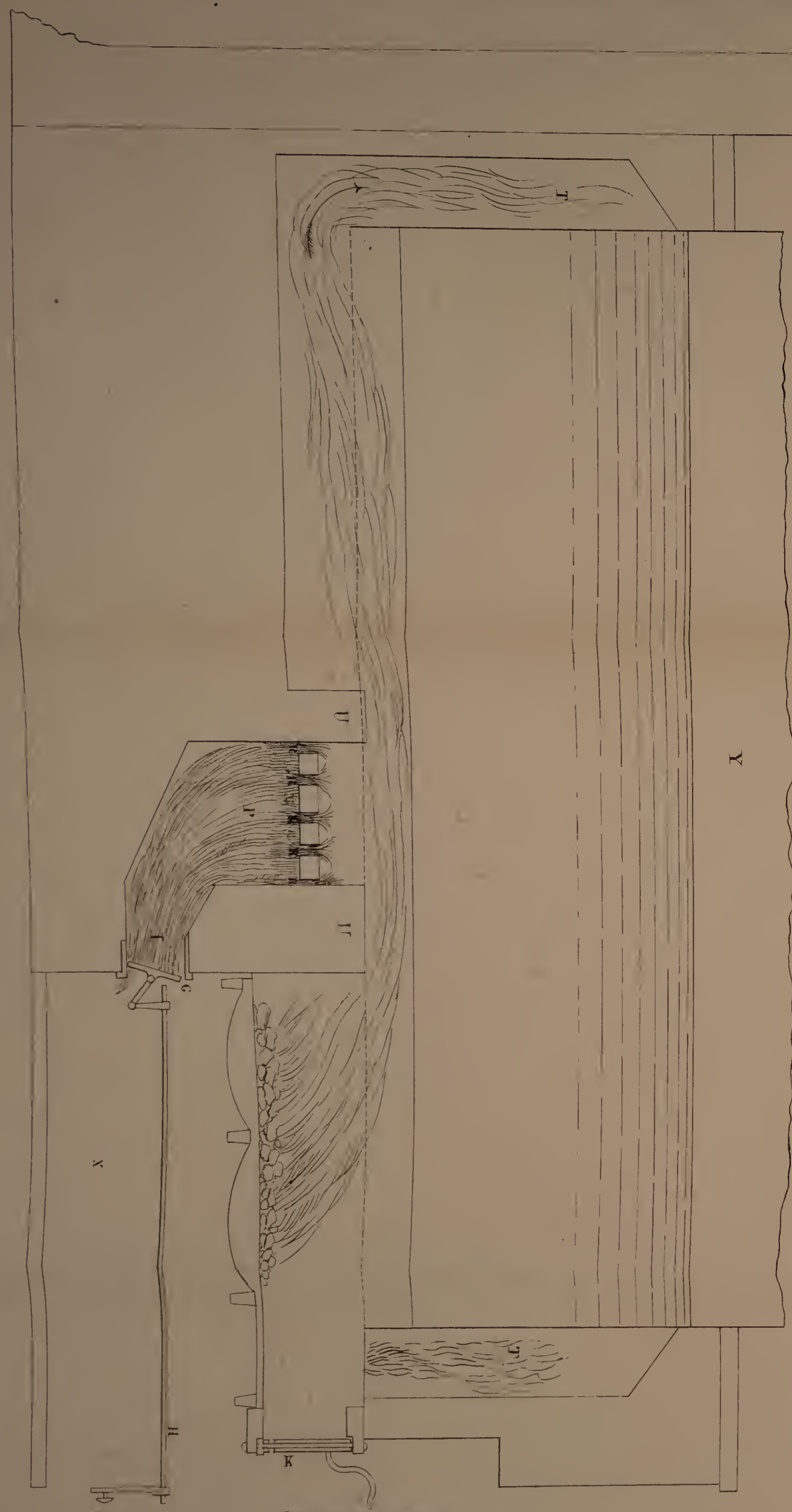
TO ALL TO WHOM THESE PRESENTS SHALL COME, I, WILLIAM PRICHARD the elder, of Burley Mills, in the Parish of Leeds, in the County of York, Manufacturer, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters
5 Patent under the Great Seal of the United Kingdom of Great Britain and Ireland,
bearing date at Westminster, the Seventh day of July, in the sixth year of Her
reign, and in the year of our Lord One thousand eight hundred and forty-two, did,
for Herself, Her heirs and successors, give and grant unto me, the said William
Prichard the elder, Her especial licence that I, the said William Prichard the
10 elder, my executors, administrators, and assigns, or such others, as I, the said
William Prichard, my executors, administrators, and assigns, should at any
time agree with, and no others, from time to time, and at all times during the
term of years therein expressed, should and lawfully might make, use, exercise;
and vend, within England and Wales, and the Town of Berwick upon Tweed,
15 my Invention of "**AN IMPROVED METHOD OF PREVENTING OR CONSUMING SMOKE
AND ECONOMIZING FUEL IN STEAM ENGINES AND OTHER FURNACES;**" in which said
Letters Patent there is contained a proviso obliging me, the said William
Prichard the elder, by an instrument in writing under my hand and seal, par-
ticularly to describe and ascertain the nature of my said Invention, and in what
20 manner the same is to be performed, and to cause the same to be enrolled in
Her Majesty's High Court of Chancery, within two calendar months next and
immediately after the date of the said recited Letters Patent, as in and by the
same, reference being thereunto had, will more fully and at large appear.

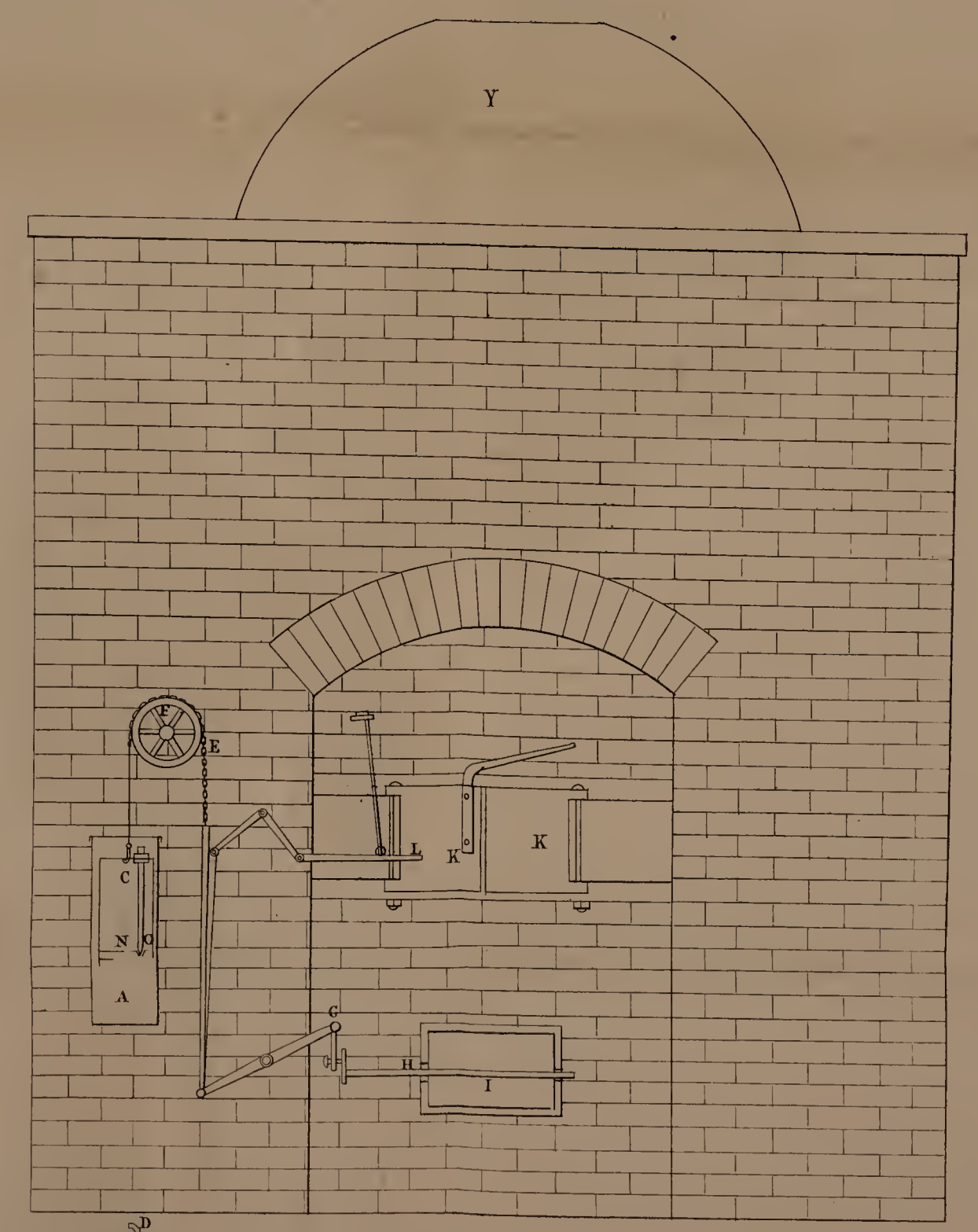
Prichard's Improved Method of Consuming Smoke in Steam Engines, &c.

NOW KNOW YE, that in compliance with the said proviso, I, the said William Prichard the elder, do hereby describe the nature of my said Invention, and the manner in which the same may be performed and carried into effect; and in order that it may be clearly understood, I have represented it on the Drawing hereunto attached, and I shall in the first place describe the 5 construction of my apparatus.

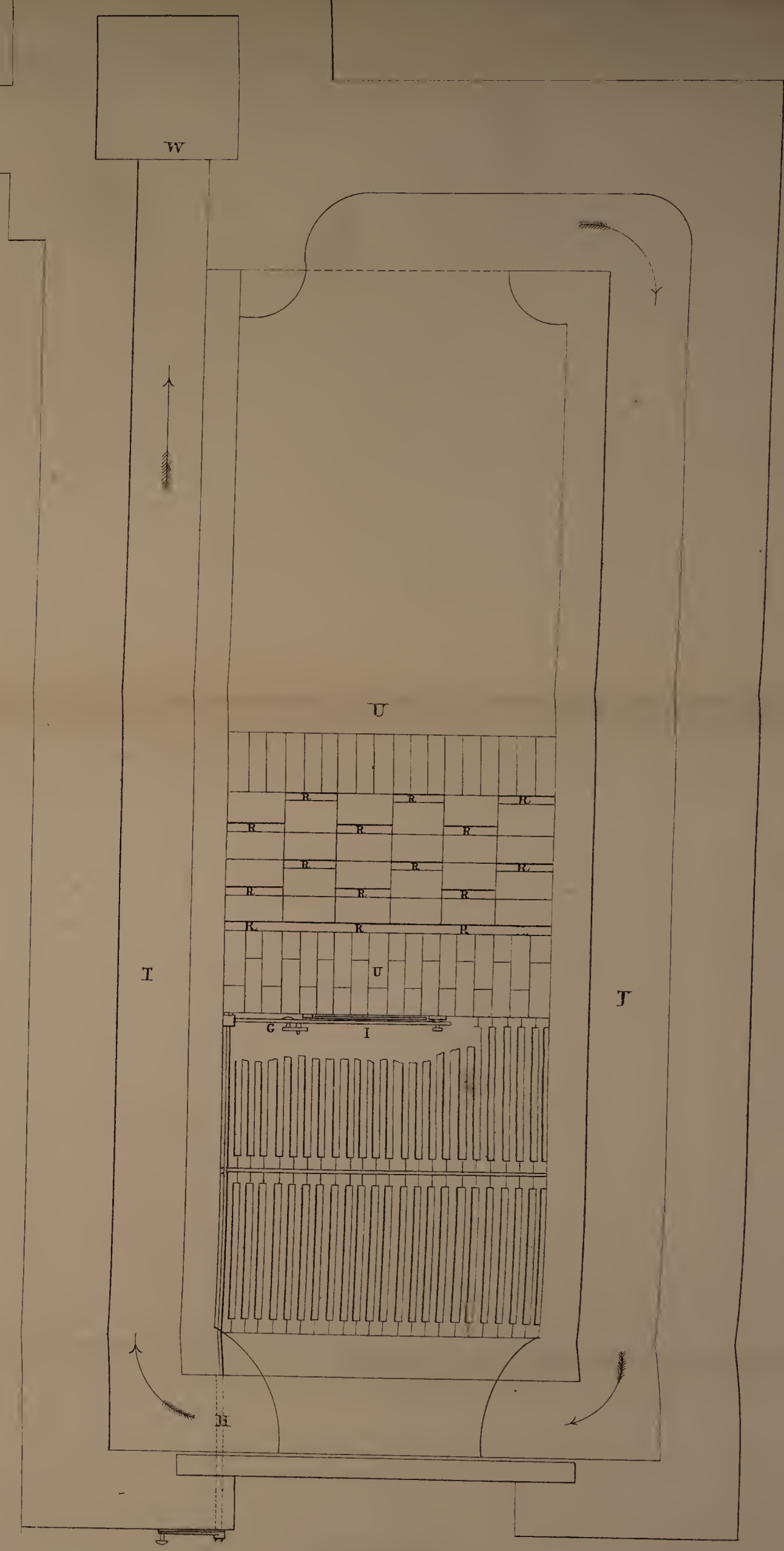
The apparatus consists of three cylinders A, B, C, made of iron, tin, copper, or any other material, one about twenty-four inches long and about eight inches bore, half filled with water, oil, or any other liquid or fluid, each of the other two cylinders B, C, twelve inches long and seven inches bore, one of 10 them having a valve and a small stop-cock D at the top; but all the three cylinders may be made of any size or dimensions which may be most convenient for use. One of the smaller cylinders, as B, must be inverted in the inside of the larger cylinder A, and be suspended by a small chain E, which chain must pass over a pulley F, and must be connected at its reverse end to 15 a lever or arm G, which lever or arm must be attached to the end of a small shaft of iron or other metal or material H, which shaft must be connected to the air flue door I, and to the furnace door or doors K. The furnace door on being opened will push against a lever or arm L, which is connected to the air flue door I, and to the inverted cylinder B, and by means thereof the 20 valve M will open to let out the air from the inverted cylinder B; and then the inverted cylinder B will descend by its own gravity through the water, oil, or other liquid or fluid in the larger cylinder A to the bottom thereof, and will thereby cause the air flue door or doors I to open, so as to admit the requisite quantity of atmospheric air to pass into the air chamber and flue connected 25 therewith. The other parts are, P, the air chamber; R, R, apertures in the brick work for the atmospheric air to pass from the air chamber to mix and mingle with combustible gases generated in the furnace; T, T, the main flues; U, U, the bridges; W, the chimney; X, the ash pit; Y, Y, the boiler. After fresh coals have been thrown upon the fire and the furnace door K, 30 closed, the stop cock D on the top of the inverted or smaller cylinder B being a little open to admit air into it, and the arm or lever G on the end of the shaft H being weighted or made heavier to counteract it, the said inverted or smaller cylinder B will descend and shut the air flue door or doors I gradually as the smoke diminishes; and when the inverted or smaller cylinder B arrives 35 at the top of the larger cylinder A the air flue door or doors I, which has or have been gradually closing during the ascent of the inverted or smaller cylinder B will be completely closed. The ascent of the inverted or smaller cylinder B may be regulated by means of the stop-cock D, so as to shut the



Longitudinal Section



End Elevation



Ground Plan



The enrolled drawing is partly colored.



Digitized by the Internet Archive
in 2019 with funding from
Wellcome Library

<https://archive.org/details/b30753107>

Prichard's Improved Method of Consuming Smoke in Steam Engines, &c.

air flue door or doors in any required space of time, by admitting more or less air into the inverted cylinder B. When the inverted cylinder B arrives at the top of the larger or outer cylinder A, the air flue door or doors I will remain shut until the door of the furnace K be opened, in order that the fire may be replenished, when the same operation will be repeated. The third cylinder C may be used in lieu of the second or smaller cylinder B herein-before described, the said cylinder C being of the same size and dimensions as the inverted or inner cylinder B herein-before described, but having instead of the valve and stop-cock described as connected with cylinder B, two valves N, O, at the bottom of the said cylinder C to open inwards. The said cylinder C must be connected in the manner herein-before described by the chain E and pulley F with the shaft H, connected with the air flue door, and the furnace door or doors K; and on opening the furnace door or doors, the larger of the two valves N will open, and the said cylinder C will descend to the bottom of the first-mentioned or larger cylinder A (within which it is to be placed) by its own gravity, and will be filled with water, oil, or any other liquid or fluid which may be placed in the first-mentioned or larger or outer cylinder A. The smaller of the two valves O in the smaller or inner cylinder C must be always kept a little open so as to allow the water, oil, or other liquid or fluid to escape from the smaller cylinder C into the larger cylinder A, by which means the smaller cylinder will ascend and perform the same operation, enclosing the air flue door or doors as the inverted cylinder B herein-before described. First, I claim the invention and the application of the principle carried into practice, of regulating and cutting off the supply of atmospheric air admitted into the furnace, or into the air chamber and flues connected therewith. Second, I claim the invention, and the application of the principle carried into practice, of increasing or diminishing, as occasion may require, the supply of atmospheric air admitted into the furnace, or into the air chamber and flues connected therewith. Third, I claim the invention, and the application of the principle carried into practice, of diminishing the supply of atmospheric air into the furnace, or into the air chamber and flues connected therewith, gradually as the quantity of smoke from the furnace diminishes. Fourth, I claim the invention, and the application of the principle carried into practice, of increasing, or diminishing, and of prolonging or shortening the supply of atmospheric air admitted into the furnace, or into the air chamber and flues connected therewith, according as the quality of the coal used or other circumstances attending the consumption thereof may require. Fifth, I claim the invention and the application of the principle carried into practice, of opening the air flue door or doors by opening or shutting the door or doors of the furnace. Sixth, I claim the invention,

Prichard's Improved Method of Consuming Smoke in Steam Engines, &c.

construction, use, and application of apparatus or combination above described, for regulating, increasing, or diminishing or cutting off the supply of atmospheric air admitted into the furnace, or into the air chamber and flues connected therewith. Seventh, I claim the invention, construction, use, and application, and combination above described, of opening the air flue, door or doors, by opening or shutting the door or doors of the furnace. Eighth, I claim the invention, construction, use, and application of apparatus or combination above described, to regulate the quantity of atmospheric air to be admitted into the furnace, or into the air chamber and flues connected therewith, and to shut the air flue door or doors in any requisite space of time. Ninth, I claim the invention, construction, use, and application of apparatus or combination above described, for gradually diminishing as the smoke from the furnace diminishes, and for ultimately cutting off, the supply of atmospheric air into the furnace or into the air chamber and flues connected therewith.

In witness whereof, I, the said William Prichard the elder, have hereunto set my hand and seal, the Thirty-first day of August, in the year of our Lord One thousand eight hundred and forty-two.

W^m PRICHARD, (L.S.) SEN^r.

Signed, sealed, and delivered by
the said William Prichard
the elder in the presence of

WILLIAM NORTH,

WILLIAM BRUCE,

Clerks to Payne, Eddison, and Ford,
Solicitors,

Leeds.

AD BE IT REMEMBERED, that on the same Thirty-first day of August, in the year above mentioned, the aforesaid William Prichard the elder came before our Lady the Queen in Her Chancery, and acknowledged the Specification aforesaid, and all and everything therein contained, in form above written. And also the Specification aforesaid was stamped according to the tenor of the Statute in that case made and provided.

Inrolled the Third day of September, in the year above written.

R. L. FORD, a Master Extraordinary of
the High Court of Chancery.

LONDON:

Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1854.